



# WINTER WEATHER AWARENESS



**A Campaign by the**  
**National Weather Service**  
**Tennessee Emergency Management**  
**Agency**  
**North Carolina Emergency**  
**Management**  
**Virginia Department of Emergency**  
**Services**

**Tennessee November 15-17, 2005**

**Virginia December 4-10, 2005**

**North Carolina December 4-10, 2005**

Winter is approaching. Hazardous weather can strike with little notice. Tornadoes strike with unwanted regularity. As winter approached three years ago, Tennesseans experienced the secondary severe weather maximum at its worst with the Veterans Day Tornado outbreak. Severe thunderstorms with downburst winds and large hail occur even more frequently. Floods and flash floods can wash people and property away with little notice.

The National Weather Service and the State Emergency Management Agencies would like to bring another weather threat to the forefront and heighten everyone's awareness of this significant weather threat – Winter Weather.

Last winter was somewhat mild with a few small snow events and several significant snow events across the southern Appalachians. January 16<sup>th</sup> 2003 saw a snowstorm move across the southern Appalachian region with 4 to 8 inches of snow in many areas. Ample forecast and warning time allowed road crews to react and prevent major problems.

The winters prior to last year were relatively mild across the region and lulled everyone into a feeling that those were what a "Normal" winter is like. The Christmas Eve 1998 ice storm caused over 17 million dollars of damage and widespread transportation problems. The winter of 95-96 saw many areas of the Southeastern U.S. experiencing a number of very heavy snow and ice

storms. Heavy snow or ice can trap people in their homes or automobiles. People are inconvenienced, injured or even killed.

Even without snow or ice, intense cold can injure or kill before a person is aware they are at risk. Fatalities from hypothermia have occurred in air temperatures of 40-50 degrees. Persons with certain chronic health conditions and those over 65 are more at risk for hypothermia, **even within the home.**

One hazard we do not often associate with winter is flooding. Floods occur when too much rain or melted snow fill river or creek basins too quickly. Along Tennessee's rivers and streams, flooding is a natural part of life and most common during winter and early spring. Frozen ground, sparse vegetation, and less evaporation are all factors that allow water to run off the land and reach the rivers quickly during the cold months.

The States of Virginia and North Carolina will highlight Winter Awareness during the week of December 4th-10th. The National Weather Service in Morristown and the Tennessee State Emergency management Agency will highlight November 16th-18th to bring these hazards to the attention of the public. We will be sending information through our communications network including the National Weather Service's NOAA Weather Radio during this period. We hope you will all join in this effort to make this the safest winter possible.

---

## From the Meteorologist in Charge—George Mathews

I wish to discuss our natural times of susceptibility. If it were a perfect world all severe weather and snow storms would happen from 7pm to 10pm--it's after rush hour, you've had something to eat, if spotters need to be at work at 7am the next morning, it's not a big deal yet. However, there are times (many of them) in which Mother Nature's time table turns our time table upside down, but we still need to be able to perform to at high levels regardless the time of day or the day of the week. I feel like Sunday mornings are when we are very susceptible. Sundays connote a time of peace, a time of family, a time of inward focus. Sunday mornings are when the business week spirals to its lowest point. Sunday mornings are a horrible time for a disaster--I feel like Sunday mornings are the most likely time of the week to have our

guard down.

Likewise the holidays connote times for family, peace, and an important time to break away from the craziness of day-to-day

life. These times can leave us dangerously susceptible. A few years ago I was involved in a huge ice storm on Christmas day. It was a perfect setup for people to have their guards down--a holiday weekend (Christmas, no less). The forecasts for Sunday called for extremely bad icing conditions, but it was Friday afternoon and most officials across the state had taken the afternoon off and were already en route to relatives, etc. I think you know where I'm going here--the ice storm struck with devastating effects--paralyzing some areas for a week with some power



# Know the Threat!!

---

## Snow and Freezing Rain

Heavy snow and/or freezing rain can immobilize a region and paralyze a city. Accumulations of snow can collapse buildings and knock down trees and power lines. Rural areas may be isolated for days. It is recommended that each household have provisions and the ability to remain self-sufficient for at least 3 days without power, or help, as it may take this long to reopen main roads and reestablish vital services.

## Hypothermia

### *Warning Signs*

Uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and apparent exhaustion.

### *Detection*

Take the person's temperature. If below 95 degrees F, immediately seek medical care. This is a life threatening situation. If care is not immediately available, begin warming the person slowly. Warm the core first. Get the person into warm clothing and wrap them in a warm blanket covering the head and neck. Do not give the person alcohol, drugs, coffee, or any very hot beverage or food, warm broth is better. Do not warm the extremities first, this drives cold blood toward the heart and may cause heart failure.

## Wind Chill

Wind Chill is based on the rate of heat loss from exposed skin caused by the combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. Animals are also affected by wind chill. The biggest question that always comes up with wind chill is, does it affect water pipes and car radiators. The answer is no, the accelerated loss of heat occurs on exposed skin only.

## Frostbite

Frostbite is damage to body tissue caused by the tissue being frozen. Frostbite causes the loss of feeling and a white or pale appearance in extremities, such as fingers, toes, earlobes, or the tip of the nose. If symptoms are detected, get medical help IMMEDIATELY. If you must wait for help, slowly re-warm affected areas. If the person is also showing signs of hypothermia, warm the body core before the extremities.

---

## Flooding

Winter is approaching and in addition to being cold and possibly snowy, it's also the flood season. Leaves are beginning to fall off the trees, and the ground will either freeze or potentially become substantially wet. Leaves trap rain and regulate the rate at which it hits the ground and sinks in. Less leaves = more rain hitting the ground faster. Wet or frozen soils can hold much less water than dry ones, and so more water hitting the ground means more runoff, instead of percolating down into the water table. More runoff = more flooding.

The summer of 2005 was relatively wet, however late summer into fall has been pretty dry. The overall rainfall for the year 2005 to date has been much below normal over most of the area. Hence, soils are dry and there is more room for water storage in the reservoirs and water table than in normally available. The outlook for autumn and early winter flooding is lower than normal. BUT...remember that one or two big rainfall events around these parts can change that pic-

ture completely. Remember the autumn of 2004 when four tropical storms moved across the region and soaked us down good. You always need to be on the lookout for potential flood problems. Even very dry top soil will enable flooding if enough rain falls at once.

Rules of safety in rain events are:

- Keep an eye on bodies of water at all times
- Pay attention to the weather where you are AND upstream from you
- NEVER drive through water running over the road
- Even after the rain, flooding may have secretly undermined roads beds

If you come to a closed or flooded road, TURN AROUND! DON'T DROWN! Don't make law enforcement officials have to go looking for you next of kin.

If you follow these simple rules, you will never have to say, "The flood came up so fast, we had no warning!"

# Before the Storm—Know the Terms

A **Winter Weather Advisory** is issued when ice or snow is expected to hinder travel, but conditions are not serious enough to require warnings.

Freezing rain is forecast when expected rain is likely to freeze as soon as it strikes the ground, potentially creating a coat of ice on roads and walkways. Sleet consists of small particles of ice mixed with rain. Sleet causes roads to freeze and become slippery.

A **Winter Storm Watch** means that severe winter weather is possible within the next

day or two.

A **Winter Storm Warning** means that severe winter weather conditions are expected within the next 24 hours. A blizzard warning means that heavy snow and winds of 35 mph or more are expected.

Be Prepared – Keep a battery powered radio and flashlights in working order, stock extra batteries.



# Before the Storm—Preparations

Be Prepared – Keep a battery powered radio and flashlights in working order, stock extra batteries.

Store drinking water and have food that can be prepared without an electric or gas stove. Stock emergency water and cooking supplies. Have candles and matches available in case of a power outage. Be careful how you use them.

Be certain that needed medications are available.

Be Prepared for isolation at home – Make sure you have sufficient heating fuel; regular fuel sources may be cut off. Have some kind of emergency heating equipment and

fuel so that you can keep at least one room warm, but do NOT use a gas fired grill inside the home. Take measures to protect plumbing from freezing. Contact local utilities for winter tips.

Keep your car or truck “winterized” - Winterizing includes being certain about antifreeze protection levels and use a gasoline additive to reduce gasoline freezing. Carry a “Winter Car Kit” that includes high energy foods, a windshield scraper, flashlight, tow rope or chain, shovel, tire chains, blanket, bag of sand or salt, fluorescent distress flag and an emergency flare – all in case you’re trapped in your vehicle by a winter storm. Keep extra gloves, mittens, hats, earmuffs and outerwear in the vehicle throughout the winter.





## **During the Storm**

**Stay Informed –** Listen to radio or television for updates on weather conditions. With early warning, you may avoid being caught in the storm, or at least be better prepared to cope with it.

**Dress for the season :** Avoid getting wet – Many layers of thin clothing are warmer than a single layer of thick clothing. Mittens are warmer than gloves. Wear a hat; most body heat is lost through the top of the head. Cover your mouth to protect lungs; don't directly inhale extremely cold air.

**Overexertion can bring on a heart attack –** a major cause of death during and after winter storms – If shoveling snow isn't critical, don't do it. If you must shovel, don't overexert yourself.

**If you are isolated at home –** Conserve fuel by keeping your house cooler than usual and by "closing off" heat to some rooms. When kerosene heaters are used, maintain ventilation to avoid toxic fumes. Use only the fuel recommended by the

manufacturer and follow operating instructions. Use a carbon-monoxide detector/alarm and a smoke alarm.

**Do Not Drive into Worsening Conditions –** If you must travel, take winter driving seriously. Travel by daylight, and keep others informed of your schedule. Drive with extreme caution. Never try to save time by driving fast or by using back-road shortcuts.

**If a Blizzard traps you in your vehicle –** Pull off the highway, stay calm and remain in your vehicle where rescuers are most likely to find you. Set your directional lights to "flashing" and hang a cloth or distress flag from the radio antenna or window.

**Do not set out on foot unless you can see a building close by where you know you can take shelter.** Be careful: distances are distorted by blowing snow. A building may seem close, but actually may be too far away to walk to in deep snow.

## **Trapped in a Vehicle**

If you run the engine to keep warm, open a window slightly for ventilation. This will help protect you from possible carbon monoxide poisoning. Periodically clear away snow from the exhaust pipe.

Exercise to maintain body heat, but avoid overexertion. In extreme cold, use road maps, seat covers, and floor mats for insulation. Huddle with passengers and use your coats as blankets.

Never let everyone in the car sleep at one time. One person should always be awake to look out for rescue crews.

Be careful not to use up all battery power. Balance electrical energy needs – the use of lights, heat and radio with supply. At

night, turn on the inside dome light, so work crews can spot you.

**If in a remote area:**

Spread a large cloth or the vehicle floor mats on the snow to attract rescue personnel who may be surveying the area from above. Once the blizzard passes, you may need to leave the car and proceed on foot to better shelter.

**Keeping in Touch** After any disaster, friends, relatives, insurance adjusters, etc. may need to locate you and your family. The following tips may reduce the confusion associated with making contact:

---

## **Evacuations**

(1) Before evacuating your home, establish a contact person (and phone number) out of the potential disaster area where friends and relatives should “check-in” with each other.

(2) When you evacuate, consider leaving a note, securely attached to the front door, telling where you can be reached – but only if you have reason to believe someone might come looking for you.

(3) If widespread damage occurs, insurance adjusters or others might have trouble identifying your home or finding you. After the danger is over, therefore, consider spray painting the following information somewhere that is highly visible: Name, address, insurance company, policy number and contact number

	December	January	February	Season
<b><u>Bristol</u></b>				
Normal High Temp	47.8	44.1	48.9	46.9
Normal Low Temps	26.8	24.3	27.0	26.0
Normal Temperatures	37.3	34.2	38.0	36.5
Normal Precipitation	3.39	3.52	3.40	10.31
Normal Snowfall	2.2	5.5	4.1	11.8
<b><u>Knoxville</u></b>				
Normal High Temperature	49.8	46.3	51.7	49.3
Normal Low Temperature	31.9	28.9	31.8	30.9
Normal Temperature	40.9	37.6	41.8	40.1
Normal Precipitation	4.49	4.57	4.01	13.07
Normal Snowfall	0.7	3.7	3.0	7.4
<b><u>Chattanooga</u></b>				
Normal High Temperature	52.0	48.8	54.1	51.6
Normal Low Temperature	32.7	29.9	32.6	31.7
Normal Temperature	42.4	39.4	43.4	41.7
Normal Precipitation	4.81	5.40	4.85	15.06
Normal Snowfall	0.1	2.0	1.3	3.4

## **Records**

### **All Time Cold Temperatures**

Chattanooga	-10	Feb 13, 1899, 1/31/1966	1/21/1985
Knoxville	-24	Jan 21, 1985	
Tri-Cities	-21	Jan 21, 1985	

### **Coldest Average Winter**

Chattanooga	34.8	1962-63
Knoxville	34.2	1963-64
Tri-Cities	30.0	1976-77, 1977-78

### **Coldest Monthly Average**

	Dec		Jan		Feb	
Chattanooga	34.3	1917	28.5	1977	33.8	1895
Knoxville	29.2	1876	26.7	1940	30.5	1895
Tri-Cities	27.8	1963	22.1	1977	28.1	1958

### **Snowfall**

	Dec		Jan		Feb		Mar		Seasonal	
Chattanooga	14.8	1886	15.8	1893	17.3	1895	20.0	1993	23.9	1894-95
Knoxville	25.4	1886	15.1	1962	25.7	1895	20.2	1960	56.7	1959-60
Tri-Cities	12.9	1963	22.1	1966	20.4	1979	27.9	1960	51.0	1959-60

### **24 Hour Snowfall**

Chattanooga	12.0	1886	10.2	1988	9.9	1912	20.0	1993
Knoxville	8.9	1969	12.0	1962	17.5	1960	14.1	1993
Tri-Cities	9.6	1969	13.0	1996	11.5	1996	14.2	1993

MIC from page 2

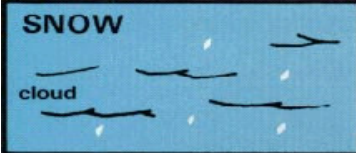
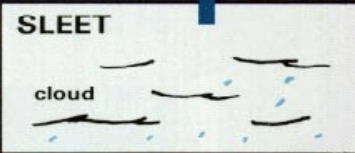
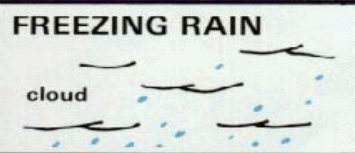



outages lasting more than four weeks. Numerous officials had no idea the storm was coming or at least that it was going to be that bad. Talking with some of them later, it seemed like their minds were already geared toward the holidays and they started kind of a selective listening--not really letting all the information sink in.

I write this note to plant a seed to make sure we all go into the holiday season pro-actively to be ready for a holiday disaster. Chances are--that out of three holidays, not all of them will be threatening. I mentioned before about how holidays are an important time to break away from the craziness of day-to-day life--it's very important to break away and be able to recharge. Take advantage of each quiet holiday to recharge if possible, but be mindful of the possibility of a bona fide disaster during holidays as well. We'll do our best to let you know when you can have time to recharge versus times you may need to take charge!

Stay safe and keep in touch,

George

Cloud Base

<b>SNOW</b>  cloud	28° 29°	<b>SLEET</b>  cloud	34° 33° 32°	<b>FREEZING RAIN</b>  cloud	36° 35° 34°
	30° 31° 31° 30°		31° 30° 30° 30°		33° 32° 31°
Cloud temperature is cold enough for snow to form; air above the ground does not melt it.	30°	Rain freezes to ice pellets which do not stick to surfaces, but accumulate on the ground.	30°	Glaze of ice forms over surfaces.	30°

## Snow

**Flurries:** Light snow falling for short durations. No accumulation or light dusting is all that is expected.

**Showers:** Snow falling at varying intensities for brief periods of time. Some accumulation is possible.

**Squalls:** Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant. Snow squalls are best known in the Great Lakes region.

**Blowing Snow:** Wind driven snow that reduces visibility and causes significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground that is picked up by the wind.

**Blizzard:** Winds over 35 mph with snow and blowing snow reducing visibility to near zero.

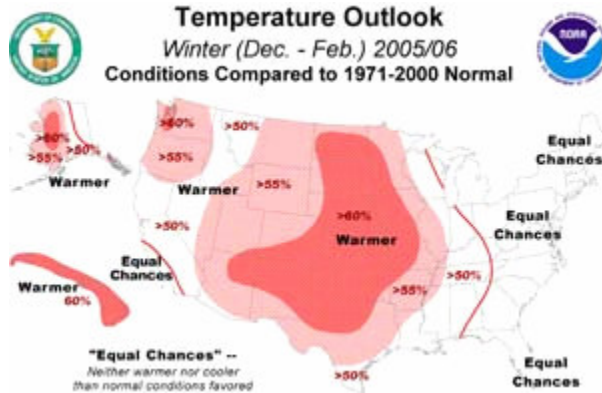
## Sleet

Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects. However, it can accumulate like snow and cause a hazard to motorist.

## Freezing Rain

Rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Even small accumulations of ice can cause a significant hazard.





Oct. 12, 2005 — [NOAA](#) announced the 2005-2006 U.S. Winter Outlook today for the months December, January and February. NOAA forecasters expect warmer-than-normal temperatures in most of the U.S. The precipitation outlook is less certain, showing equal chances of above, near or below normal precipitation for much of the country. **(Click [NOAA image for larger view of forecast winter temperatures for the USA. Click here for high resolution version. Please credit "NOAA."](#))**

"Even though the average temperature over the three-month winter season is forecast to be above normal in much of the country, there still will be bouts of winter weather with cold temperatures and frozen precipitation," said retired Navy Vice Admiral [Conrad C. Lautenbacher, Jr.](#), Ph.D., undersecretary of commerce for oceans and atmosphere and NOAA administrator.

NOAA does not expect La Niña and El Niño/Southern Oscillation ([ENSO](#)) to play a role in this winter's forecast. Without ENSO, forecasters look to other short-term climate factors, like the North Atlantic Oscillation, in determining the overall winter patterns. Under these conditions there tends to be more variability in winter weather patterns across the nation, especially in the Great Lakes region and the northeast U.S.

### The Outlook

The [2005-2006 U.S. Winter Outlook](#) calls for warmer-than-normal temperatures across much of the central and western United States, including Alaska and Hawaii. The Midwest, the Southern Californian coast and the East Coast have equal chances of warmer, cooler or near-normal temperatures this winter.

The precipitation outlook calls for wetter-than-normal conditions across most of Arkansas, Louisiana, Oklahoma, and northeastern Texas. Drier-than-normal conditions are expected across the Southwest from Arizona to New Mexico. **(Go to: [www.noaanews.noaa.gov/stories2005/images/winter-outlook-2005-2006-precip.jpg](http://www.noaanews.noaa.gov/stories2005/images/winter-outlook-2005-2006-precip.jpg) for high resolution version. Please credit "NOAA.")**

As winter approaches, nearly 20 percent of the nation is in some level of drought compared to around 30 percent of the country this time last year as defined by the [U.S. Drought Monitor](#). For the sixth year in a row, drought remains a concern for parts of the Northwest and northern Rockies. Wet or dry conditions during the winter typically have a significant impact on drought conditions. Winter-spring snow pack is particularly important in the West, as much of the annual water supply comes from the springtime snow melt. NOAA cautions it would take a number of significant winter snowstorms to end the drought in the Pacific Northwest and northern Rockies.

### What Could Drive This Winter's Weather?

For more information contact the National Weather Service at (423) 586-3771 or e-mail [Howard.waldron@noaa.gov](mailto:Howard.waldron@noaa.gov), regular mail 5974 Commerce Blvd; Morristown, TN 37814, or your **LOCAL** Emergency Management Director.

Since early 2005 sea-surface temperatures in the central-equatorial Pacific Ocean have been near normal. Near normal sea-surface temperatures in the central-equatorial Pacific Ocean are expected to continue for the next three to six months. Therefore, it is unlikely that either the El Niño or La Niña phases of the El Niño/Southern Oscillation (ENSO) cycle will be present during the upcoming winter. As a result, one key climate feature that could have a particularly large impact in U.S. winter weather, especially along the East Coast, is the North Atlantic Oscillation or NAO.

The [North Atlantic Oscillation](#) often changes its phase from week-to-week. During the positive phase, the jet stream shifts to the north of its usual position and the winter weather features relatively warm days over much of the contiguous U.S. In contrast, during the negative phase the jet stream shifts to the south of its usual position. The negative phase of the NAO features more Nor'easters and more frequent cold air outbreaks and snow-storms, especially along the East Coast. Currently, the phase of the NAO is difficult to anticipate more than one to two weeks in advance.

Recognizing the demand to have more precision with seasonal outlooks, the NOAA Climate Prediction Center has formed a [Climate Test Bed](#). The Climate Test Bed is a collaborative scientific effort among the operational, academic and research communities. The mission of the Climate Test Bed is to accelerate the transfer of atmospheric and oceanic research and development into operational climate forecasts, products and applications. At present the Climate Test Bed is focused on maximizing the use of the NOAA Climate Forecast System model in combination with other climate forecast tools to improve U.S. seasonal precipitation and temperature outlooks.

NOAA will publish updates to the 2005-2006 U.S. Winter Outlook via the Web Oct. 20, and Nov. 17. Meteorological winter begins Dec. 1 while astronomical winter begins Dec. 21.

NOAA, an agency of the [U.S. Department of Commerce](#), is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and providing environmental stewardship of the nation's coastal and marine resources.

### **Relevant Web Sites**

[Climate Factors Helping to Shape Winter 2005-2006:](#)

<http://www.noaanews.noaa.gov/stories2005/s2520b.htm>

[NOAA Climate Prediction Center](#) : <http://www.cpc.ncep.noaa.gov/>

[NOAA Drought Information Center](#): <http://www.drought.noaa.gov/>

[El Niño/Southern Oscillation \(ENSO\) Diagnostic Discussion:](#)  
[http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/enso\\_advisory/](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/)